

Benign surgical emphysema of the hand and upper limb: gas is not always gangrene—a report of two cases

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Subcutaneous emphysema of the hand can result from benign causes. Differentiating this from emphysema caused by gas-forming organisms is essential in the acute stages of presentation as the management differs considerably. We present two cases of benign surgical emphysema and highlight the importance of distinguishing between this and gas gangrene. A considered history and the absence of systemic features associated with benign causes of subcutaneous air will prevent unnecessary surgical exploration.

Benign subcutaneous emphysema of the hand and upper limb of non-infectious aetiology has been documented in several case reports.^{1–3} Correct diagnosis in the accident and emergency department will avoid the unnecessary surgical exploration for a benign condition. Subcutaneous emphysema of benign aetiology is not associated with other symptoms and the patient is systemically well. It has been reported as a result of high pressure injury from power tools, minor puncture wounds creating a one way valve mechanism, airgun injury, and surgical procedures to the hand. The following cases highlight the importance of careful concise knowledge of the history, absence of systemic features, as well as regarding specific signs such as crepitus in the context of other signs and symptoms and not in isolation.

CASE 1

A healthy 40-year-old right handed woman sustained a puncture wound in the first web space of her left hand with the tip of a clean kitchen knife. She presented to the accident and emergency department 8 h after the injury complaining of a swollen left hand and no other symptoms.

She was afebrile and non-tachycardic. There was minor localised redness at the wound site and crepitus palpable throughout the dorsal and volar compartments of the hand, extending to the wrist. The white cell count (WCC) was normal and subsequent blood cultures were negative. Radiographs of the hand revealed air in the subcutaneous tissues (fig 1A).

She was treated conservatively with elevation and intravenous antibiotics, remained well, and was discharged home the next day.

CASE 2

A healthy 19-year-old right handed labourer sustained a puncture wound

to the dorsum of his left hand with a metal spike 1 month before presentation. He attended our accident and emergency department with a 24 h history of gradual swelling, redness and increasing pain at the site of original injury.

He was afebrile and non-tachycardic. There was localised erythema at the wound site and crepitus palpable throughout the dorsum of his left hand, extending proximally to the mid forearm level. The WCC and C reactive protein (CRP) were normal and subsequent blood cultures were negative. Radiographs of the hand and forearm revealed air in the subcutaneous tissues (fig 1B).

A decision for surgical exploration was made. Operative findings showed no evidence of infection or necrotic tissue and muscles appeared healthy. He remained at all times systemically well with a normal WCC and negative blood cultures. He was discharged home 48 h after initial presentation.

DISCUSSION

Subcutaneous emphysema affecting an isolated limb is rare and not all subcutaneous air in the hand or upper limb signifies a life threatening

infection. It is important to differentiate benign conditions in the acute setting of accident and emergency from gas gangrene (clostridial myonecrosis) or crepitant infection caused by other gas-forming bacteria, such as anaerobic streptococci and some coliform bacteria.¹

Butt and colleagues³ describe a case of surgical emphysema of the hand treated only with antibiotics, and Filler *et al*² reported an additional three cases, all of which were successfully managed conservatively. Both groups point out that infection from gas-forming organisms usually takes 12–18 h to develop and that gas in the subcutaneous tissue within 6–10 h of trauma is most likely to be indicative of a benign process.

In the two cases presented here, there was a history of injury with the patient remaining well at all times. Inflammatory indices were normal, and a mechanical one way valve mechanism for the accumulation of air in the subcutaneous tissue was the most likely explanation. Under such circumstances, it is acceptable to reassure the patient and discharge on oral antibiotics with an outpatient follow up appointment. Conservative treatment has been suggested for subcutaneous emphysema in patients who are systemically well, with minimal pain at the site of injury and in the absence of extensive cellulites.^{1–4}

CONCLUSION

Benign causes of subcutaneous emphysema should be considered in patients presenting without any signs and symptoms of an infectious process or systemic illness. This will avoid the unnecessary aggressive treatment for a benign condition which is reserved for gas gangrene.

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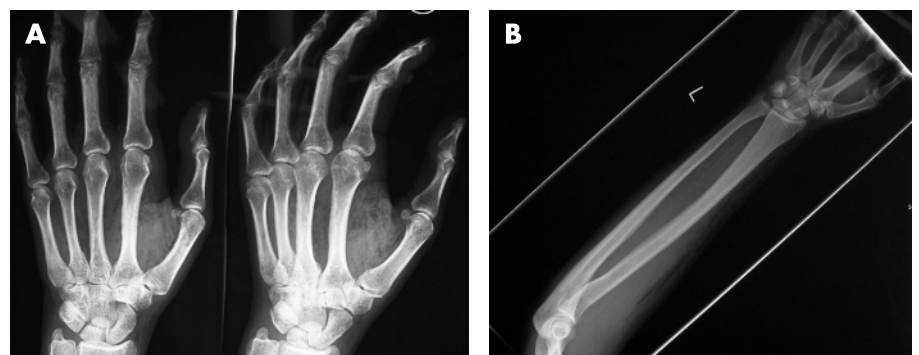


Figure 1 (A) Anteroposterior (AP) and oblique radiograph of the left hand in case 1 showing gas in the subcutaneous tissues. (B) AP radiograph of the left hand and forearm in case 2 showing gas in the subcutaneous tissues.

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IMAGES IN EMERGENCY MEDICINE

Rupture of pectoralis major: an occupational injury

P R Catterson, R D Jarman

A 41-year-old doorman attended the emergency department with a history of sudden pain and a popping sensation to the anterior aspect of his right shoulder on restraining a person in the course of his work the previous evening. He had swelling and bruising as shown in fig 1. He was diagnosed with a distal rupture of his right pectoralis major muscle (PM). He subsequently underwent surgical exploration and repair.

The condition is primarily diagnosed clinically but magnetic resonance imaging is widely accepted as the modality of choice in evaluating possible tears of PM.

Non-surgical management is recommended only for proximal tears and for elderly, sedentary patients. Otherwise,

surgery is advocated to enable return to full strength and function. Rehabilitation involves a gradual progression to the increase range of movement and muscle strength, and patients can usually return to full activity in 3–6 months.¹

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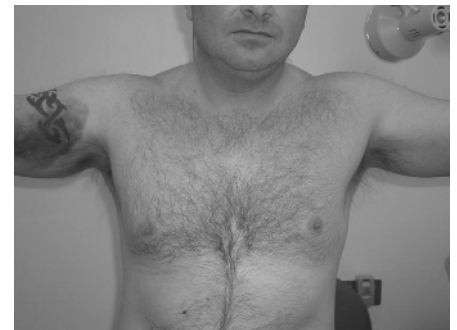


Figure 1 Presentation of patient showing swelling and bruising. Informed consent was obtained for publication of this figure.

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